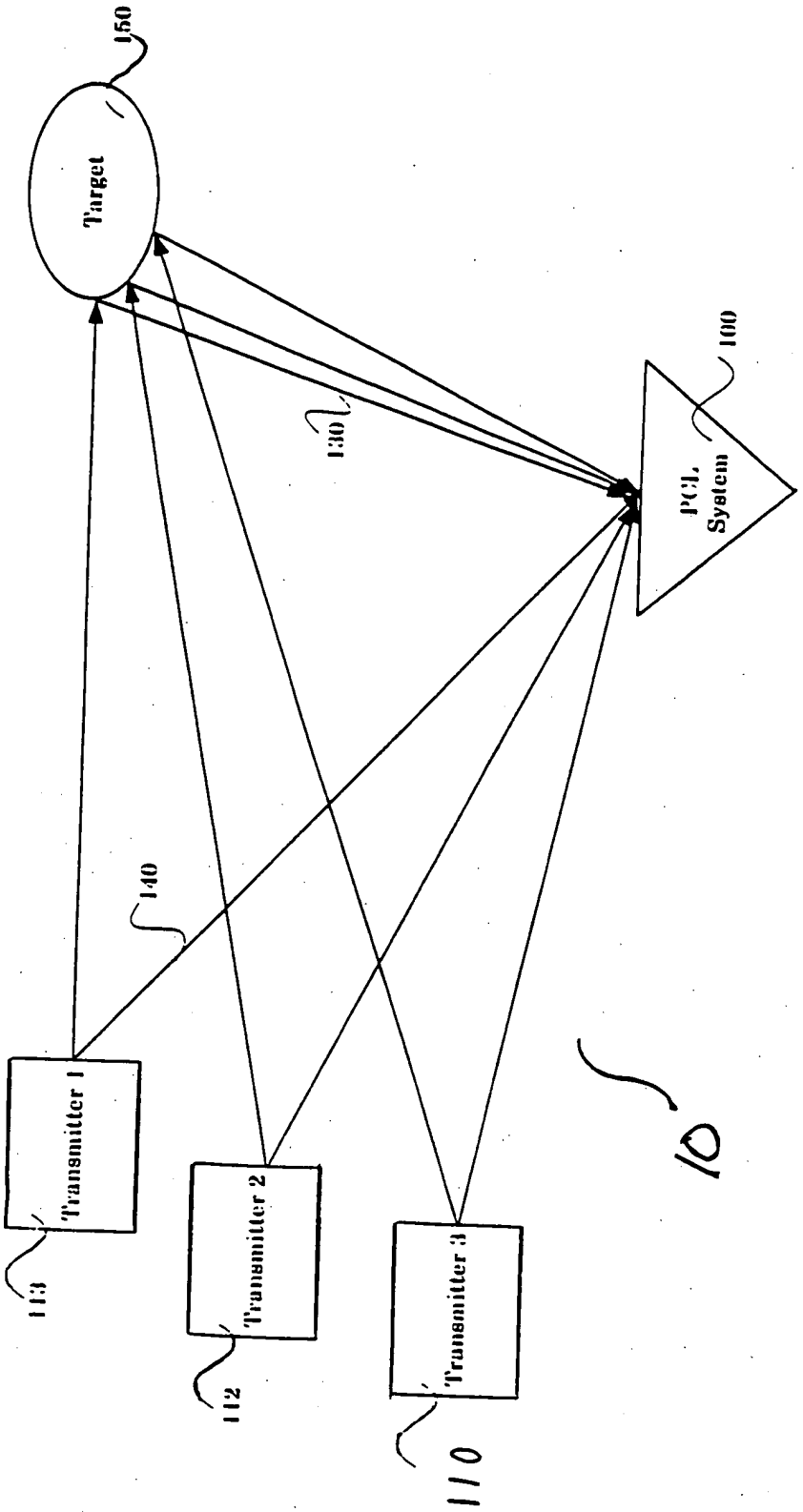
150
Target
130
100
PCL System
140
Transmitter 1
113
Transmitter 2
112
Transmitter 3
110
10

FIG. 1

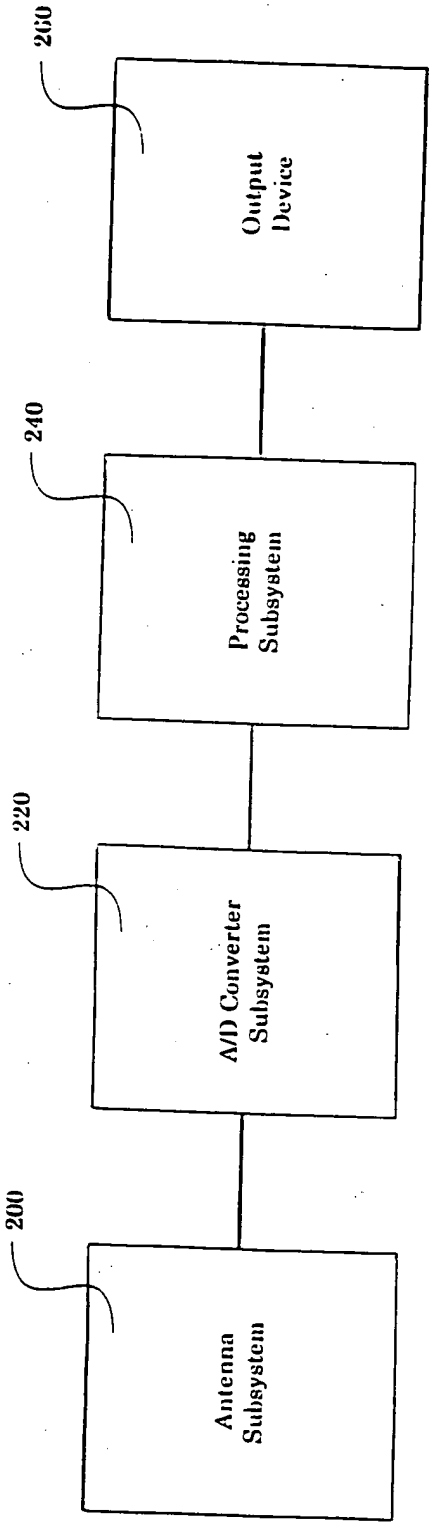
260
Output Device
240
Processing Subsystem
220
A/D Converter Subsystem
200
Antenna Subsystem

FIG. 2

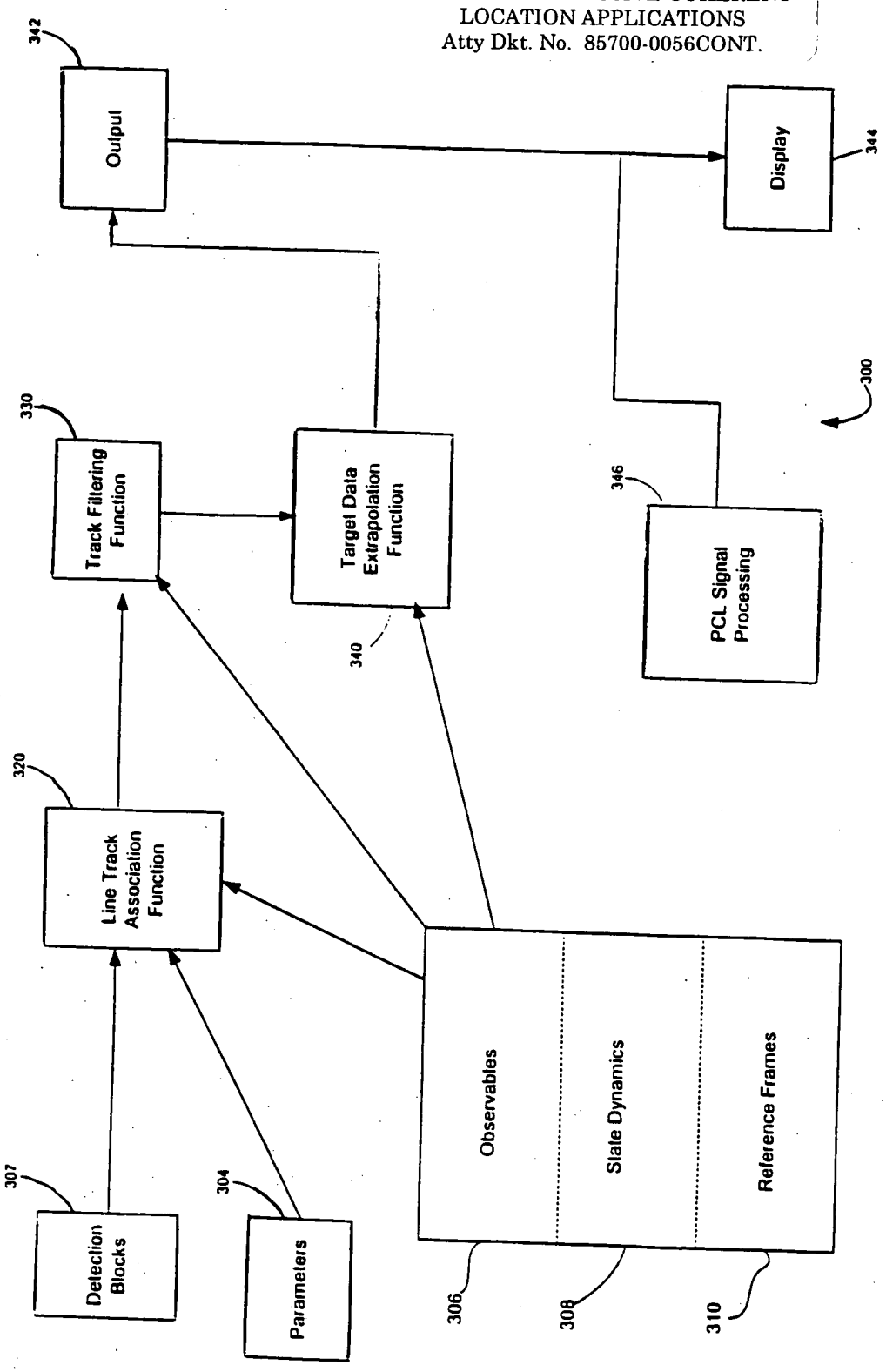
342
Output
Display
344
300
330
Track Filtering Function
Target Data Extrapolation Function
340
346
PCL Signal Processing
320
Line Track Association Function
Observables
State Dynamics
Reference Frames
306
308
310
307
Detection Blocks
304
Parameters

Fig. 3A

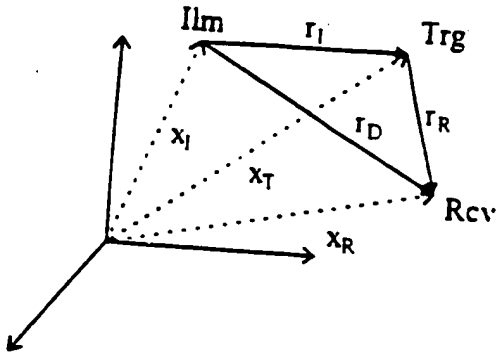
Ilm
r_I
Trg
r_R
r_D
x_I
x_T
Rcv
x_R
$r_I = x_T - x_I$
$r_R = x_T - x_R$
$r_D = x_I - x_R$

FIG. 3B

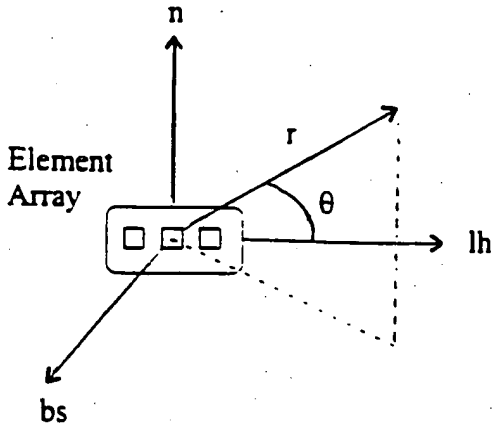
n
r
Element
Array
θ
lh
bs

FIG. 3C

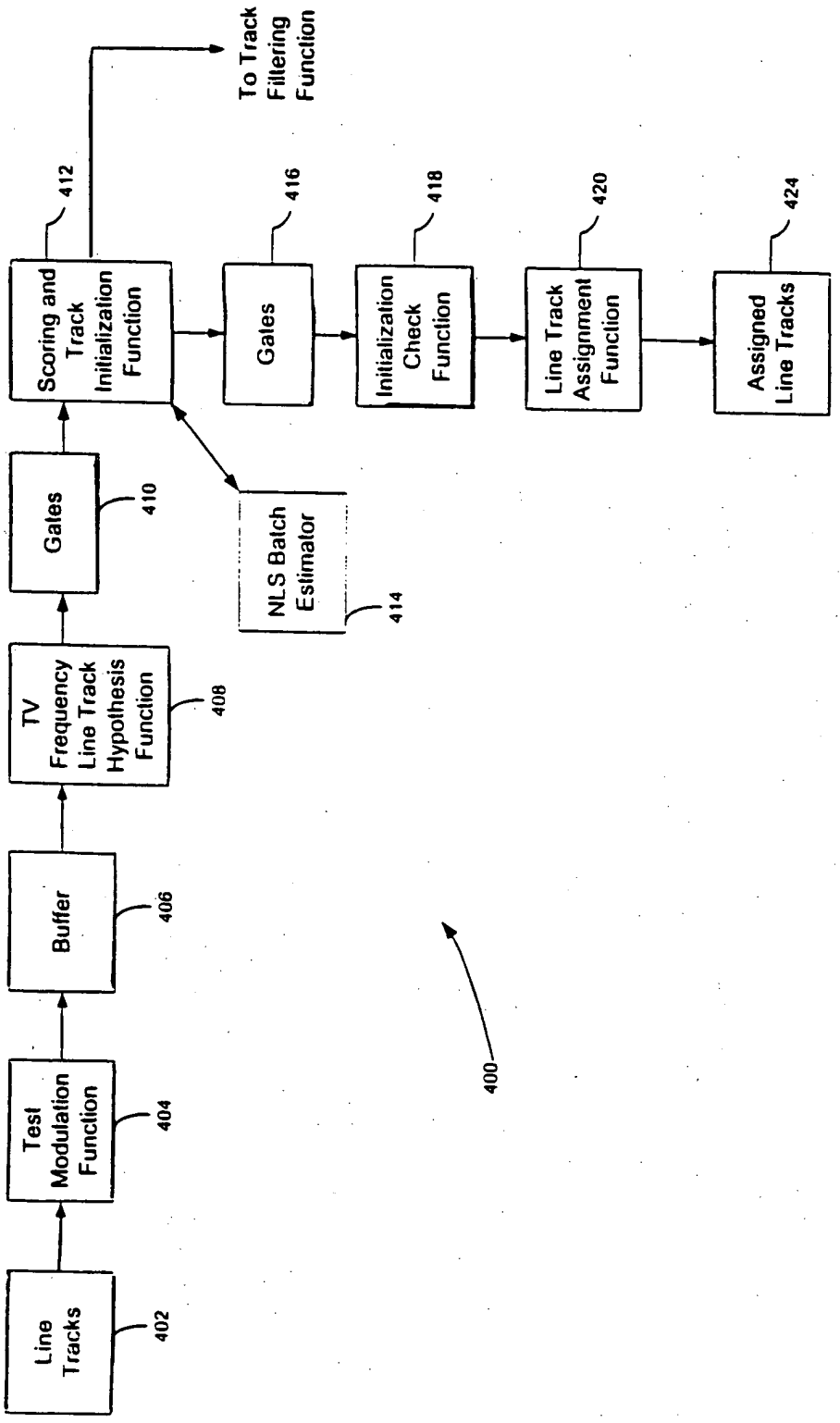
Line Tracks
402
Test Modulation Function
404
Buffer
406
TV Frequency Line Track Hypothesis Function
408
Gates
410
Scoring and Track Initialization Function
412
NLS Batch Estimator
414
Gates
416
Initialization Check Function
418
Line Track Assignment Function
420
Assigned Line Tracks
424
To Track Filtering Function
400

Fig. 4

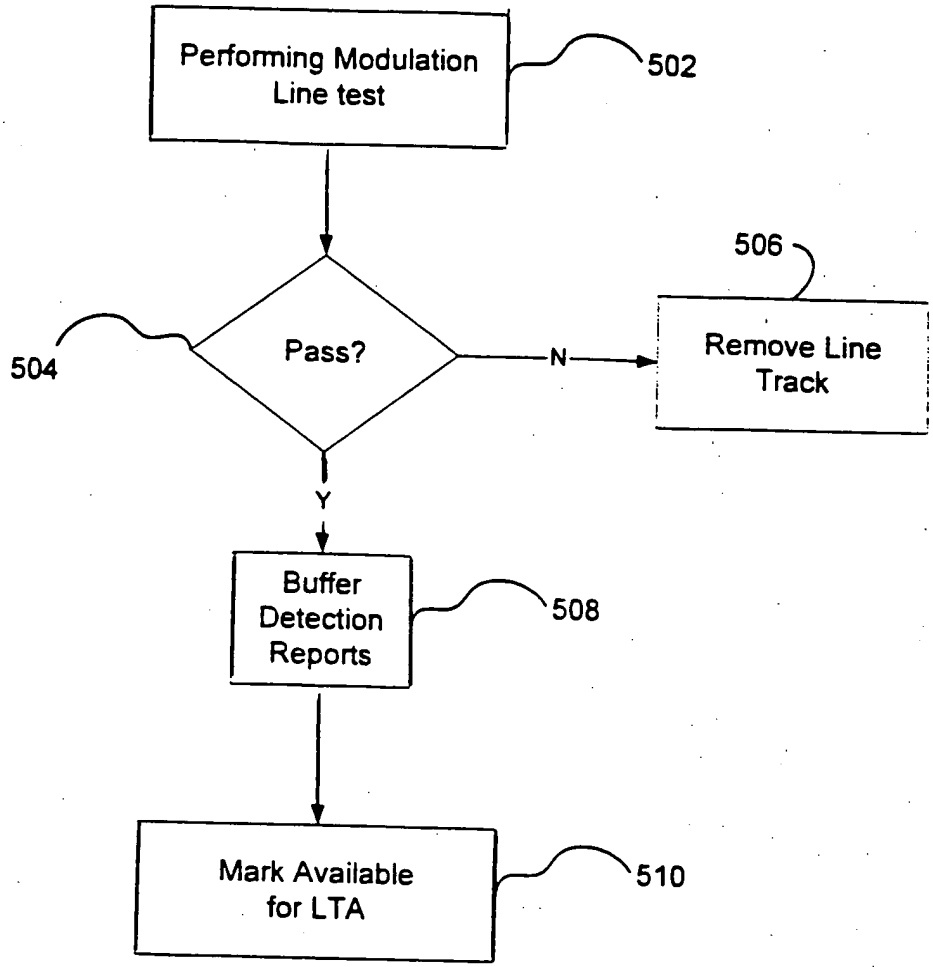
Performing Modulation Line test
502
506
Pass?
504
N
Remove Line Track
Y
Buffer Detection Reports
508
Mark Available for LTA
510

Fig. 5

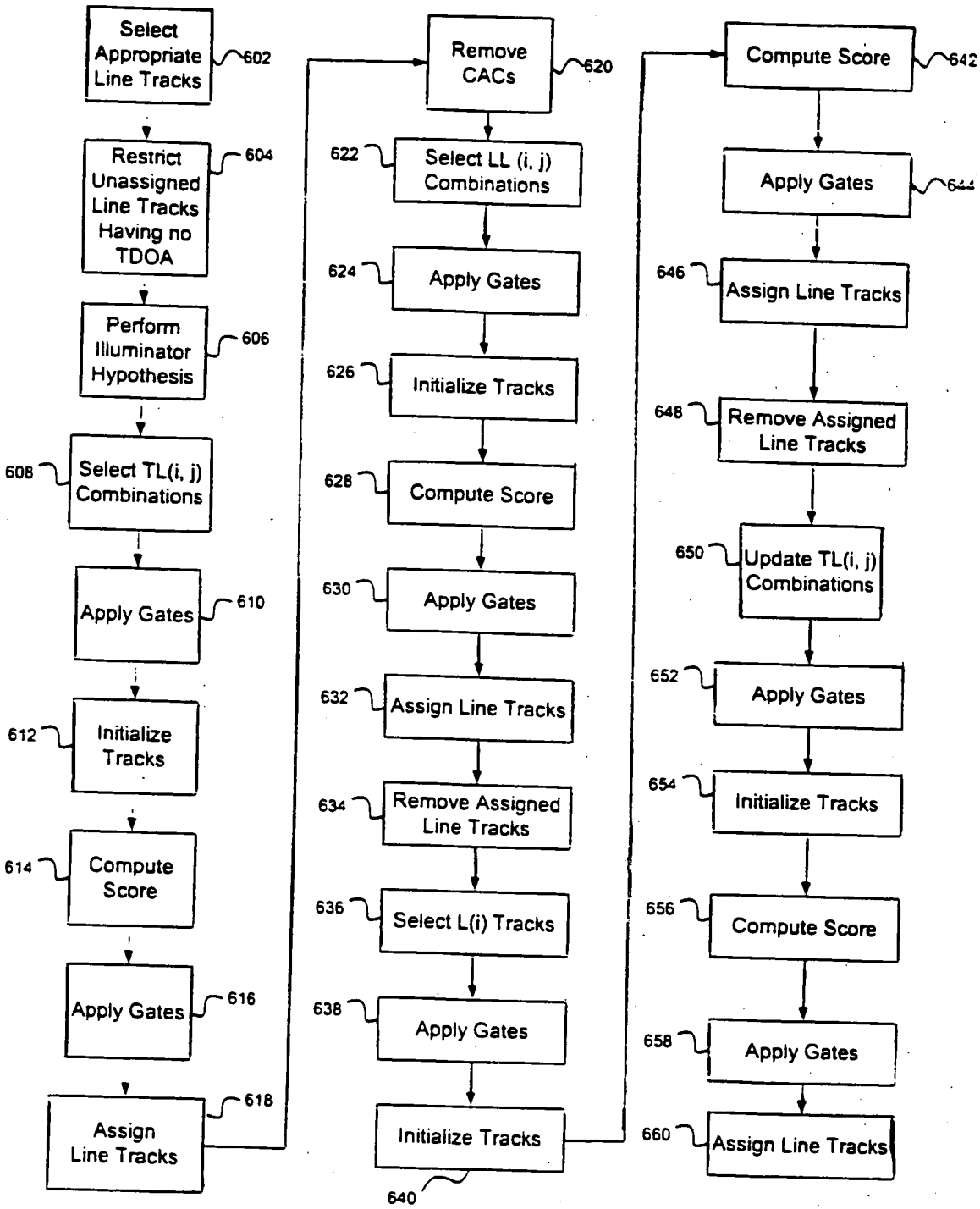
Select Appropriate Line Tracks
602
Restrict Unassigned Line Tracks Having no TDOA
604
Perform Illuminator Hypothesis
606
608
Select TL(i, j) Combinations
Apply Gates
610
612
Initialize Tracks
614
Compute Score
Apply Gates
616
Assign Line Tracks
618
Remove CACs
620
622
Select LL (i, j) Combinations
624
Apply Gates
626
Initialize Tracks
628
Compute Score
630
Apply Gates
632
Assign Line Tracks
634
Remove Assigned Line Tracks
636
Select L(i) Tracks
638
Apply Gates
Initialize Tracks
640
Compute Score
642
Apply Gates
644
646
Assign Line Tracks
648
Remove Assigned Line Tracks
650
Update TL(i, j) Combinations
652
Apply Gates
654
Initialize Tracks
656
Compute Score
658
Apply Gates
660
Assign Line Tracks

Fig. 6

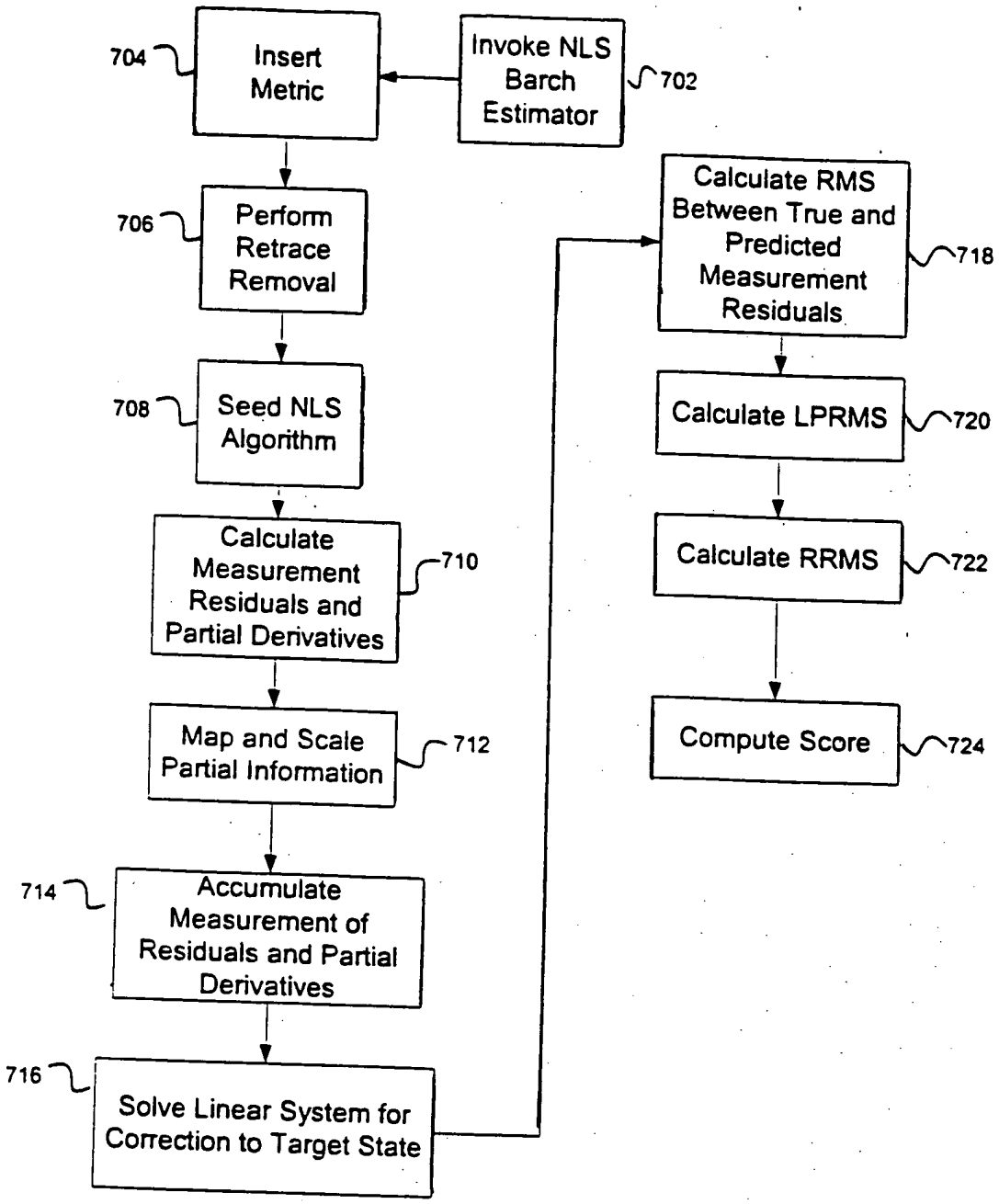
Invoke NLS Barch Estimator
702
704
Insert Metric
706
Perform Retrace Removal
708
Seed NLS Algorithm
Calculate Measurement Residuals and Partial Derivatives
710
Map and Scale Partial Information
712
714
Accumulate Measurement of Residuals and Partial Derivatives
716
Solve Linear System for Correction to Target State
Calculate RMS Between True and Predicted Measurement Residuals
718
Calculate LPRMS
720
Calculate RRMS
722
Compute Score
724

Fig. 7

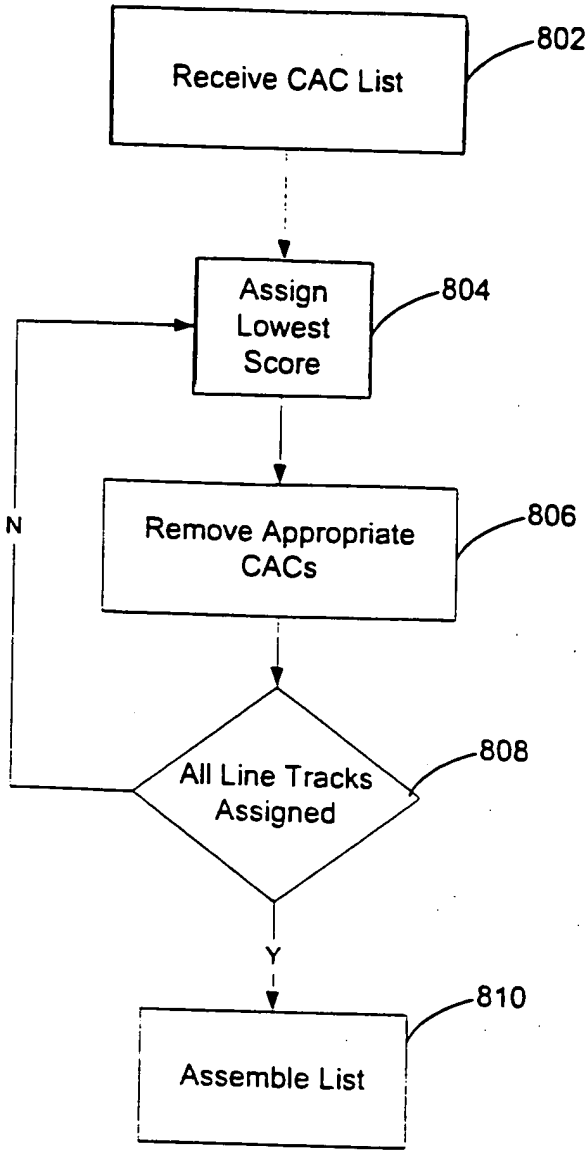
Receive CAC List
802
Assign Lowest Score
804
Remove Appropriate CACs
806
All Line Tracks Assigned
808
N
Y
Assemble List
810

Fig. 8

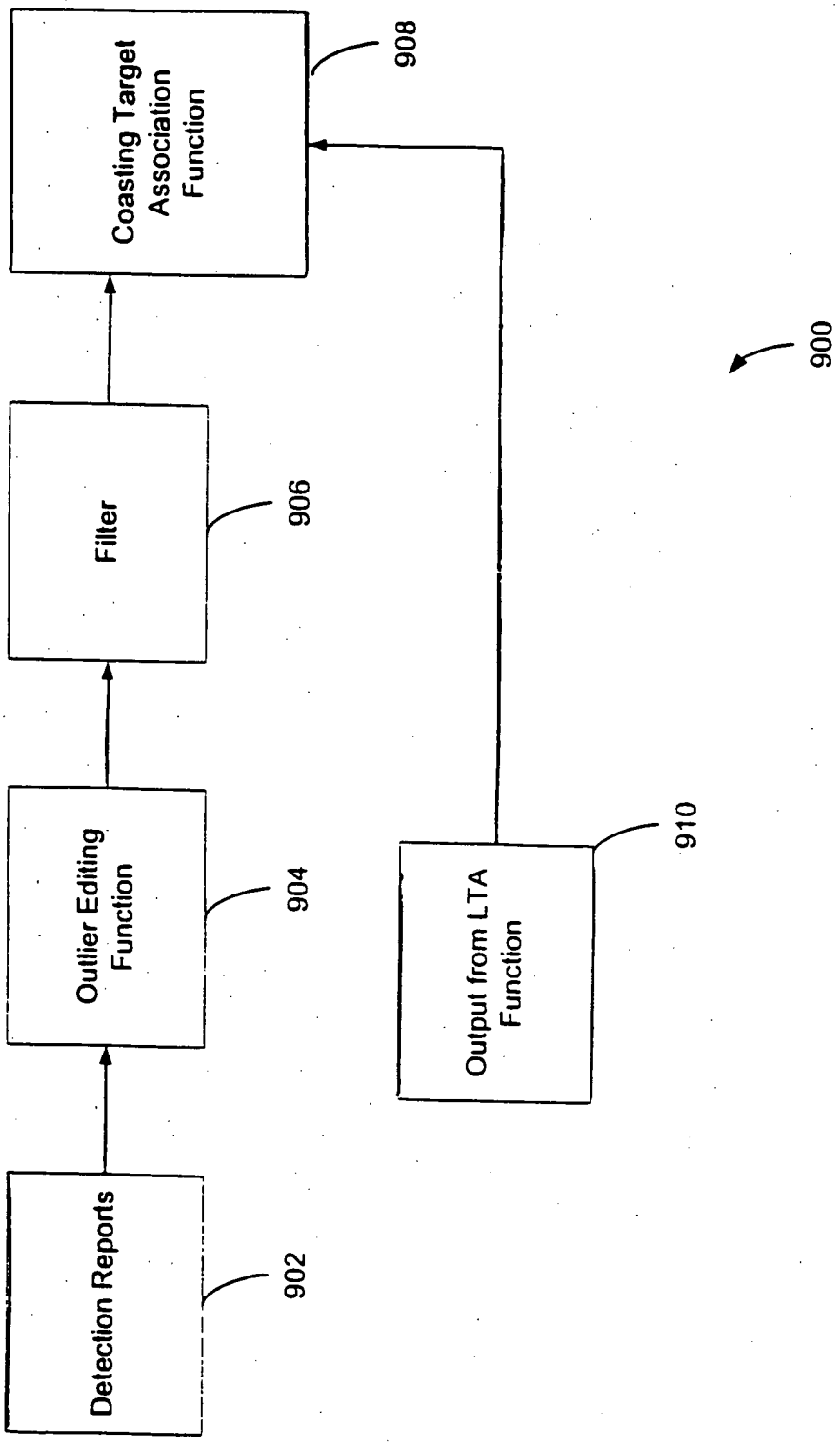
Coasting Target Association Function
908
Filter
906
Outlier Editing Function
904
Detection Reports
902
Output from LTA Function
910
900

Fig. 9

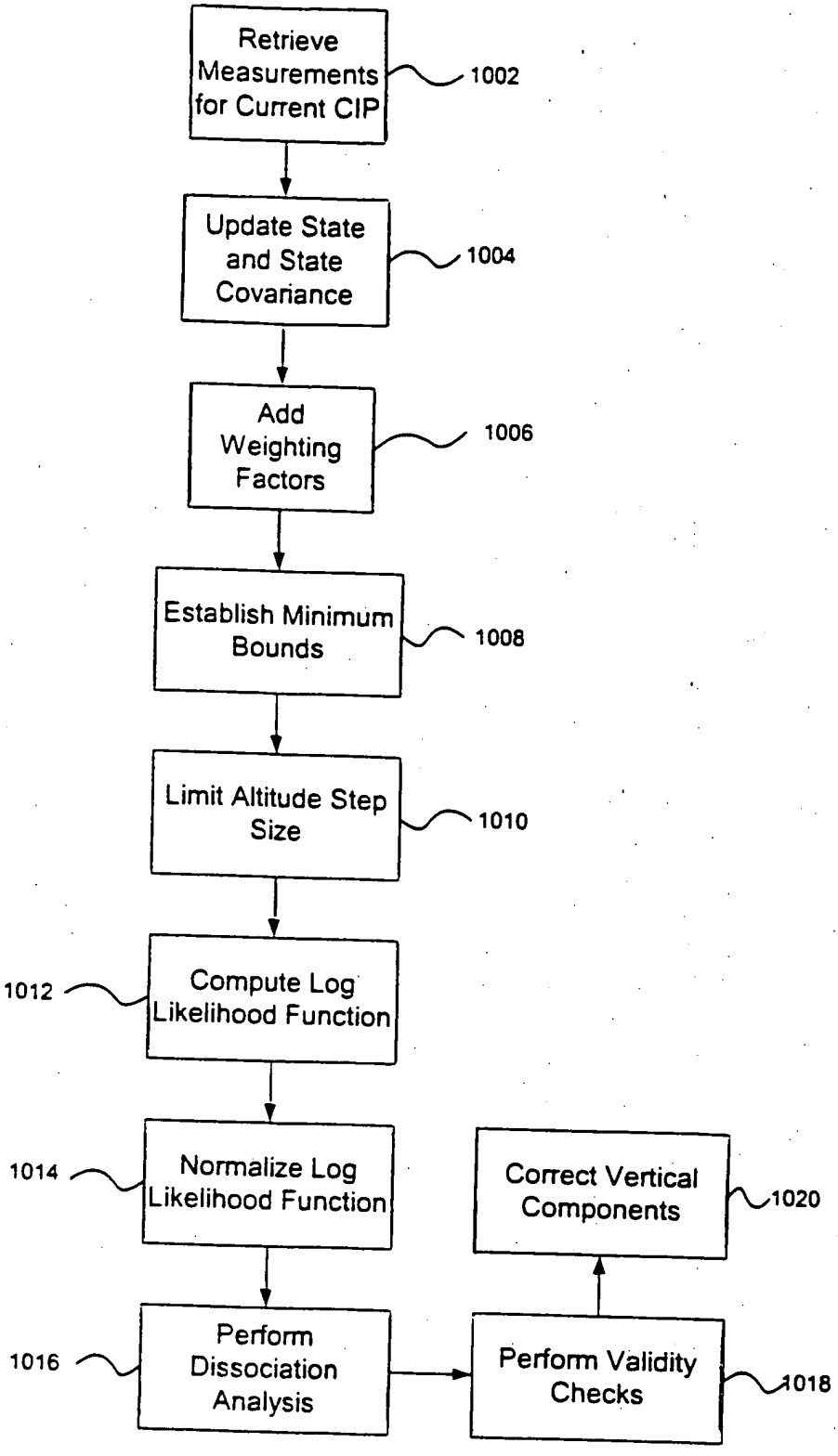
Retrieve Measurements for Current CIP
1002
Update State and State Covariance
1004
Add Weighting Factors
1006
Establish Minimum Bounds
1008
Limit Altitude Step Size
1010
1012
Compute Log Likelihood Function
1014
Normalize Log Likelihood Function
1016
Perform Dissociation Analysis
Perform Validity Checks
1018
Correct Vertical Components
1020

Fig. 10

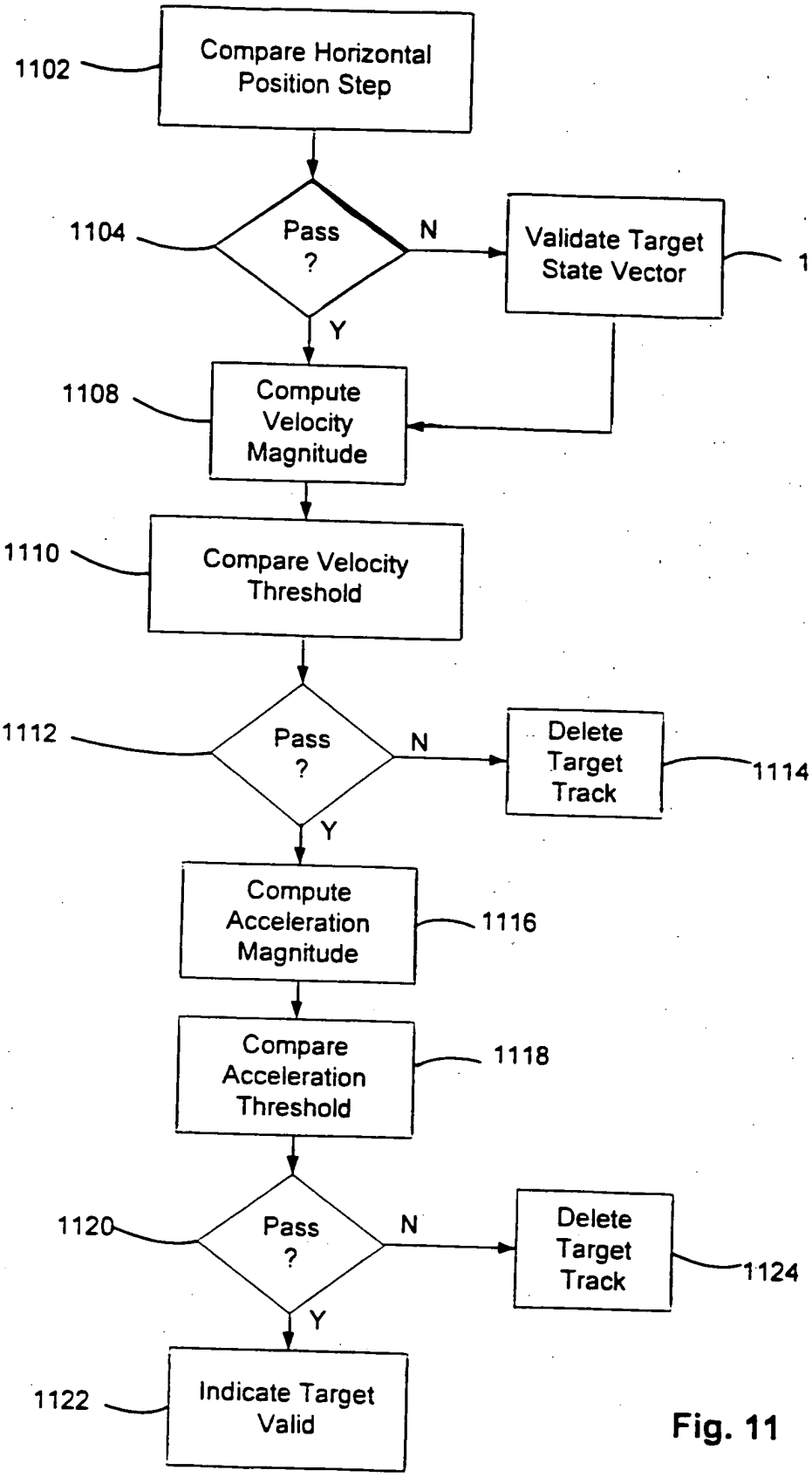
1102
Compare Horizontal Position Step
1104
Pass ?
N
Validate Target State Vector
1106
Y
1108
Compute Velocity Magnitude
1110
Compare Velocity Threshold
1112
Pass ?
N
Delete Target Track
1114
Y
Compute Acceleration Magnitude
1116
Compare Acceleration Threshold
1118
1120
Pass ?
N
Delete Target Track
1124
Y
1122
Indicate Target Valid

Fig. 11

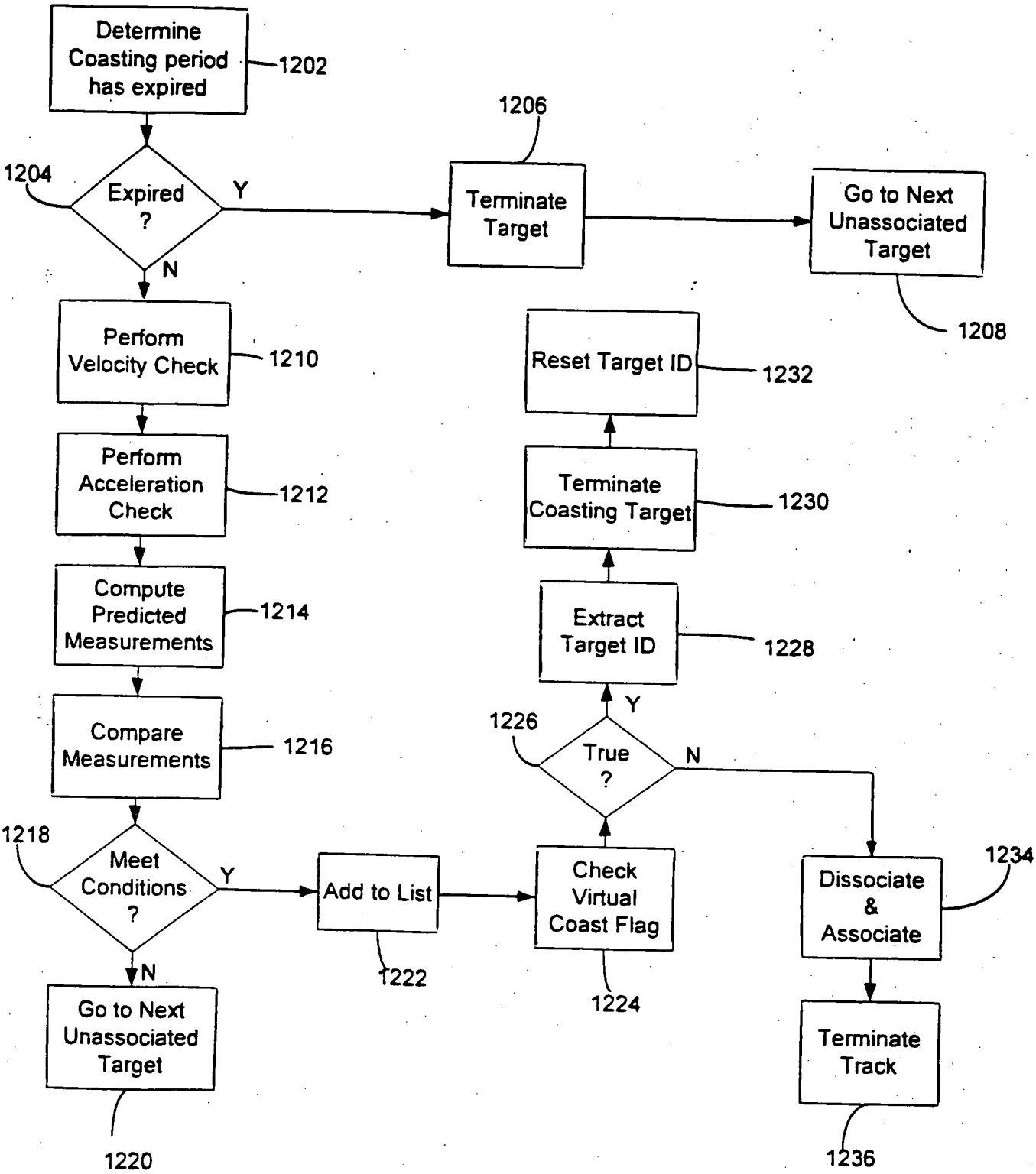
Determine Coasting period has expired
1202
1204
Expired ?
Y
N
1206
Terminate Target
Go to Next Unassociated Target
1208
Perform Velocity Check
1210
Perform Acceleration Check
1212
Compute Predicted Measurements
1214
Compare Measurements
1216
1218
Meet Conditions ?
Y
N
Add to List
1222
Go to Next Unassociated Target
1220
Reset Target ID
1232
Terminate Coasting Target
1230
Extract Target ID
1228
1226
True ?
Y
N
Check Virtual Coast Flag
1224
Dissociate & Associate
1234
Terminate Track
1236

Fig. 12